

### **REMARKS/ARGUMENTS**

Claims 35-37, 44, 45, 48-54 and 60 to 67 remain in this application and are not withdrawn.

In the Office Action, the Examiner withdrew claim 45 as being directed to a non-elected species. Claim 45 is directed to an oligomer or a polymer of a saccharide according to claim 35, wherein the saccharide is glucose. The Examiner's withdrawal of claim 45 was improper, as the subject matter of claim 45 is not directed to a non-elected species. The only species election made against this application regarding the nature of the oligomer or polymer of a saccharide is found on page 5 of the Office Action issued on April 30, 2003, where under the heading "ELECTION II" the Examiner stated: "Each oligomer/polymer of glucose, such as cellulose or amylose is considered to be a distinct species". As claim 45 is directed to an oligomer or a polymer of a saccharide where the saccharide is glucose, and not to a specific oligomer or polymer of glucose, claim 45 does not fall within the species which is the subject of ELECTION II.

Claims 35-37, 44, 45 and 48-54 have been amended to only refer to an oligomer of a saccharide. Claim 35 has also been amended to distinguish from the prior art cited.

Claim 43 has been cancelled.

New claims 60-67 are similar in scope to claims 35-37, 44, 45 and 52-54, but are directed to a straight-chained polymer of a saccharide instead of an oligomer of a saccharide. Support for the new claims is found, for example, in the claims as originally filed and on page 4 of the description.

Applicants respectfully submit that no new matter has been added.

#### **Concerning the rejection of claims 35-37, 43, 44 and 48-54 under 35 U.S.C. 112**

The Examiner has rejected claims 35-37, 43, 44 and 48-54 on the basis that there is no support for the use of the term "amino" in these claims. Reconsideration of this rejection is requested.

The reaction scheme found on page 10 of the specification, which displays an oligomer or polymer according to an embodiment of the invention, clearly displays an amino linkage between the saccharide ( $\beta$ -cyclodextrin) and the electrophilic or nucleophilic moiety. While the

text on page 10 discussing the above reaction scheme describes the linkage as being an imino moiety, it is clear from the reaction scheme that an amino linkage is depicted, thus the reference to "imino" is an obvious typographical error.

**Concerning the rejection of claims 35-37, 43, 44 and 48-54 under 35 U.S.C. 102(b) and 103(a)**

The Examiner has cited US Patent 6,017,458 (the '458 patent) against the above claims, saying that the reference anticipates and makes obvious the subject matter of these claims.

Reconsideration of this rejection is requested.

In the '458 patent, every oligomer of a saccharide (cyclodextrin) is restricted to one or at most two linkages (pendant moieties) attached to a support material. Therefore, the majority of the saccharide moieties in the oligomers of the '458 patent do not have any pendant electrophilic or nucleophilic moieties. This differs from the teachings of the present invention, where each and every saccharide moiety of the oligomer of a saccharide has one or more pendant electrophilic or nucleophilic moieties. In addition, it would not be obvious from the teachings of the '458 patent and from the general common knowledge of a person skilled in the art to provide each saccharide moiety of an oligomer or polymer of a saccharide with one or more pendant electrophilic or nucleophilic moieties.

Claim 35 has been amended to clarify this feature.

The '458 patent also fails to disclose an oligomer of a saccharide having pendent groups where the pendent groups are linked via one or more carbamate, ester or amino linkages, as in the present application. While the '458 patent refers to urethane linkages, which correspond to carbamate linkages, references to the term "urethane" in the cited document are clearly due to a clerical error as all the processes described and claimed lead to urea linkages [-NHC(O)NH-] and not to urethane linkages [-NHC(O)O-]. None of the processes described in the '458 patent would lead to an oligomer of a saccharide having pendent groups linked via carbamate, ester or amino linkages.

New claims 60-67 are not anticipated or obvious from the teachings of the '458 reference as they are directed to a straight-chained polymer of a saccharide and not to a cyclic oligomer of a saccharide (cyclodextrins), as in the cited reference. Additionally, the '458 fails to disclose a polymer of a saccharide having pendent groups where the pendent groups are linked via one or more carbamate, ester or amino linkages, as discussed above.

**Concerning the rejection of claims 35-37, 43, 44 and 48-54 under 35 U.S.C. 103(a)**

The Examiner has cited US Patent 5,639,824 to Okamoto (the '824 patent), in view of US Patent Nos 6,017,458 (the '458 patent), 5,104,547 (the '547 patent) and 4,298,500 (the '500 patent), against the above claims, saying that the combination of these references renders the claims obvious. Reconsideration of this rejection is requested.

The '824 patent teaches cyclic oligosaccharides, where 70% or more of the hydroxyl moieties are replaced by non-reactive functional groups, and where the remaining hydroxyl groups are replaced with "spacer" groups that are bound to a support. As indicated in column 4, lines 60-62 of the '824 patent, it is essential that "The degree of replacement by the functional groups is at least 70%...based on all the hydroxyl groups". Since the functional groups of the '824 patent, which act as substantially inert functionalizing groups and not as reactive groups, replace 70% or more of the hydroxyl groups found in the cyclic oligosaccharide, the spacer groups of the '824 patent, which "spacer" groups correspond to the "reactive electrophilic moieties or nucleophilic moieties" of the present invention, are not present on each of the saccharide moieties that form the cyclic oligosaccharide. When 70% or more of the hydroxyl groups of the cyclic oligosaccharide are replaced by non-reactive functional groups, it becomes impossible for each and every saccharide moiety to bear a "spacer" or pendant group.

The '824 patent therefore fails to render the present invention obvious, as similar to the '458 patent above, it fails to teach an oligomer of a saccharide where each saccharide moiety of the oligomer or polymer of saccharide has one or more pendant electrophilic or nucleophilic moieties.

In addition, as none of the '458, '547 or '500 patents teach an oligomer or polymer of a saccharide where each saccharide moiety has one or more pendant electrophilic or nucleophilic moieties, there are no combinations of these patents with the '824 patent that renders the present invention obvious.

New claims 60-67 are not obvious from the '824 patent, in view of the '458 patent, the '547 patent and the '500 patent, as the '824 patent only teaches cyclic oligosaccharide derivatives. There are no combinations of the '824, '458, '547 and '500 patents that would lead to a straight-chained polymer of a saccharide as claimed in any one of claims 60 to 67, as the

only saccharide-based compounds described in these references are cyclic oligosaccharides (cyclodextrins).

**Concerning the rejection of claims 35-37, 43, 44 and 48-54 under 35 U.S.C. 103(a)**

The Examiner has also cited US Patent 5,198,429 to König *et al* (the '429 patent), in view of US Patent Nos 6,017,458 (the '458 patent), 5,104,547 (the '547 patent) and 4,298,500 (the '500 patent), against the above claims, saying that the combination of these references render the claims obvious. Reconsideration of this rejection is requested.

The '429 reference teaches substituted cyclodextrin molecules, in which cyclodextrin molecules hydroxyl groups are substituted through ether linkages. As presently amended, claim 35 recites that the pendant moieties are linked to a saccharide via one or more carbamate, ester or amino linkages.

As none of the '429, '458, '547, or '500 patents teach an oligomer or polymer of a saccharide where each saccharide bears a pendant moiety which is linked via a carbamate, ester, or amino linkage, there are no combinations of these patents that would render claim 35 as amended obvious. As the remaining claims that are rejected by the examiner are dependent on claim 35, they are also themselves not obvious.

New claims 60-67 are not obvious from the '429 patent, in view of the '458 patent, the '547 patent and the '500 patent, as the '824 patent only teaches cyclic oligosaccharide derivatives. There are no combinations of the '824, '458, '547 and '500 patents that would lead to a straight-chained polymer of a saccharide as claimed in any one of claims 60 to 67, as the only saccharide-based compounds described in these references are cyclic oligosaccharides (cyclodextrins).

**Concerning the further rejection of claims 36, 37 and 44 under 35 U.S.C. 103(a)**

The Examiner has further rejected claims 36, 37 and 44, as being obvious from the '824, '429, '458, '547, and '500 patents discussed above. As the same references are applied against the claims, the arguments as to unobviousness detailed above again apply. Reconsideration of this rejection is respectfully requested.

**Concerning the further rejection of claim 44 under 35 U.S.C. 103(a)**

The Examiner has further rejected claim 44, as being obvious from the patents enumerated above in conjunction with US Patent No 5,964,996 to Armstrong et al (the '996 patent). There are three criteria for establishing a prima facie case of obviousness: (a) all features must be present, (b) there must be an expectation of a reasonable chance of success, and (c) there must be some suggestion in the prior art to combine the references. The Examiner has not met all of the above criteria in making his rejection.

The '996 patent is directed to separating agents comprising macrocyclic antibiotics attached to a stationary phase. While the Examiner considers that it would be obvious to combine the '996 patent with the previously discussed patents to support the interchangeability of ethers and amines as linking agents, there are no suggestions in the '996 patent that linking agents suitable for attaching macrocyclic antibiotics would be suitable for use with oligomers or polymers of a saccharide. Furthermore, macrocyclic antibiotics are complex molecules having a large number functional groups that can be utilised to perform linkages to a stable support, and the strategies for attaching such a molecule to a support do not automatically translate into sound strategies for linking pendant groups to an oligomer or polymer of a saccharide. While the '996 patent and the other cited references are related to the broad topic of separation agents, there are no suggestions in the cited references that linking techniques suitable for macrocyclic antibiotics having complex structural and chemical characteristics would be readily applicable to oligomers or polymers of a saccharide.

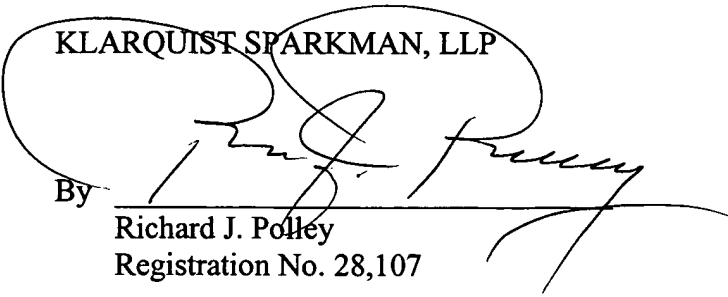
In addition, the chemistry of forming ether linkages and amine linkages is very different, and in that regard, the use of one or the other of these linkages cannot be considered "interchangeable". In the present application, amine linkages are first attached by displacement of an electrophilic leaving group (e.g. a tosylate group) attached to the saccharide moiety. There are no examples of such a process in the '996 reference or in any of the other references cited, and the preparations of ether linkages described in some of the cited references use very different chemistry.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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